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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,835	02/02/2004	Srinath Krishnan	039153-0694	9075

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EXAMINER

MENZ, DOUGLAS M

ART UNIT	PAPER NUMBER
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2891

DATE MAILED: 12/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/769,835

Applicant(s)

KRISHNAN, SRINATH

Examiner

Douglas M. Menz

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) 9-16 and 21-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Park et al. (US 6482715).

Regarding claim 1, Park discloses a method of manufacturing an integrated circuit having trench isolation regions in a substrate, the method comprising:

Forming a mask layer (104, Fig. 3A) above the substrate;

Selectively etching the mask layer to form apertures associated with locations of the trench isolation regions (104, Fig. 3A);

Forming trenches (106a-b, Fig. 3A) in the substrate at the locations;

Forming first type liners (108, Figs. 3E-G) on first side walls of the trenches associated with first type regions of the substrate (Cols. 4-5); and

Forming second type liners (comprising 108, 110, 112, Figs. 3E-G) on second side walls of the trenches associated with second type regions (Cols. 4-5).

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Regarding claim 2, Park further discloses providing an insulative material (116) in the trenches to form trench isolation regions (Figs. 3F-G).

Regarding claim 3, Park further discloses removing the insulative material (116) until a silicon nitride layer (104) is reached (Fig. 3F).

Regarding claim 4, Park further discloses wherein the first type liners are a first thickness and the second type liners are a second thickness, the second thickness being different than the first thickness (Fig. 3G).

Regarding claim 5, Park further discloses wherein the first type liners (108) are dry oxide material (Col. 4) and the second type liners (110) are dry heavily nitrided oxide material (Col. 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (US 6482715) in view of Lee et al. (US 6737706).

Regarding claims 6-7, Park discloses the method of claim 1 as mentioned above, however, Park does not explicitly disclose wherein the substrate is on an SOI substrate as in regards to claim 6 or that the substrate trenches reach a buried insulative layer of the substrate as in regards to claim 7. Lee discloses that it is known in the art to form trench isolation features (41) on SOI substrates (30) wherein the trenches reach the buried insulative layer (15) (Fig. 1 and Col. 1). It would have been obvious to one of ordinary skill in the art to implement Park's method with a SOI substrate as taught by Lee because Lee explicitly discloses in the background section that such teachings are conventional.

Regarding claim 8, Park discloses the method of claim 1 as mentioned above and further discloses a first and second region (P and N type), however, Park does not explicitly disclose wherein the substrate includes a strained silicon layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Park's teachings with a strained silicon layer because doing so was well known in the art at the time of the invention.

Response to Arguments

Applicant's arguments filed 10/4/06 have been fully considered but they are not persuasive. Applicant argues that Park does not disclose two types of liners on the sidewalls of the trenches. Examiner disagrees. Park clearly discloses two types of liners (see Fig. 3G) that separate insulative material 116 from substrate 100, Fig. 3G. The first type of liner formed in region A2, Fig. 3G, consists of layer 108, Fig. 3G. The second type of liner formed in region A1, Fig. 3G, consists of layers 108, 110 and 112, Fig. 3G. Applicant's claim language states "first type liners" and "second type liners". Such broad claim language is explicitly disclosed in Fig. 3G.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas M. Menz whose telephone number is 571-272-1877. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DM

 12/6/06
Doug Menz